



**Identification of factors influencing  
effective uptake of cervical cancer  
screening services among Armenian  
women**

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by

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## ABBREVIATIONS

ADHS	Armenian Demographic Health Survey
CI	Confidence Interval
CC	Cervical Cancer
CCS	Cervical Cancer Screening
ICO	Information Center on HPV and Cancer
EC	Educational Component
GP	General Practitioner
GDP	Gross Domestic Product
FDA	Food and Drug Administration
HCS	Health Care System
HIC	High Income Countries
HPV	Human papillomavirus
HSB	Health Seeking Behavior
LIC	Low Income Countries
M&E	Monitoring and Evaluation
MIC	Middle Income Countries
MOH	Ministry of Health
NPDTCC	National Program on Diagnosis, Treatment & Prevention of CC in Armenia
NSS	National Statistical Service
PHC	Primary Health Care
RR	Relative Risk
STI	Sexually Transmitted Infection
SU	Soviet Union
WBE	Workplace-based Education
WHO	World Health Organization

**Carcinogen** is any substance, radionuclide, or radiation that is an agent directly involved in causing cancer (Cancer. Net. 2014).

**Cervical biopsy** is a test in which tissue samples are taken from the cervix and examined for disease or other problems (Cancer. Net. 2014).

**Cervical cancer** is a tumor of cervix that begins when normal cells on the surface of the cervix change and grow uncontrollably (Cancer. Net. 2014).

**Chemotherapy** is the use of drugs to destroy cancer cells, usually by stopping the cancer cells' ability to grow and divide (Cancer. Net. 2014).

**Colposcopy** is a medical diagnostic procedure to examine an illuminated, magnified view of the cervix and the tissues of the vagina and vulva (Cancer. Net. 2014).

**Confidence interval** is an estimated statistical interval for a parameter, giving the range of values that may contain the parameter and the degree of confidence that is in fact there (Medical Dictionary 2014).

**Cold knife conisation** is the use of the same procedure as a cone biopsy to remove all of the abnormal tissue (Cancer. Net. 2014).

**Cone biopsy** removes a cone-shaped piece of tissue from the cervix (Cancer. Net. 2014).

**Cryotherapy** is a use of liquid nitrogen to freeze and kill cells (Cancer. Net. 2014).

**Incidence** is a measure of the risk of developing some new condition within a specified period of time (Medical Dictionary 2014).

**Incidence rate** is the number of new cases per population at risk in a given time period (Medical Dictionary 2014).

**HPV** is a virus that is usually passed on during direct skin-to-skin contact, most commonly via sex (Cancer. Net. 2014).

**Hysterectomy** is the removal of the uterus and cervix (Cancer. Net. 2014).

**Laser surgery** is a removal of the tumor or lesion and surrounding tissue (called a margin) during an operation by laser (Cancer. Net. 2014).

**Loop Electrosurgical Excision Procedure** is the use of an electrical current passed through a thin wire hook which removes the tissues (Cancer. Net. 2014).

**Mortality rate** is an expression of the number of deaths in a population at risk during one year (Medical Dictionary 2014).

**Opportunistic screening** is a screening done independently of an organized or population based program, on women who are visiting health services for other reasons (WHO 2006).

**Primary prevention** seeks to prevent the onset of specific disease via risk reduction: by altering behaviors or exposures that can lead to disease, or by enhancing resistance to the effects of exposure to a disease agent (WHO 2006).

**Radiation therapy** is the use of high-energy x-rays or other particles to destroy cancer cells (Cancer. Net. 2014).

**Radical trachelectomy** is a surgery to remove the cervix that leaves the uterus intact with pelvic lymph node dissection (Cancer. Net. 2014).

**Relative risk** is the ratio of chance of a disease development among members of a population exposed to a factor compared with a similar population exposed to the factor (Medical Dictionary 2014).

**Sensitivity** relates to the screening test's ability to identify a condition correctly (Medical Dictionary 2014).

**Specificity** relates to the screening test's ability to exclude a condition correctly (Medical Dictionary 2014).

**Background:** Armenia is a lower middle income country situated in the southern Caucasus Mountains in Eastern Europe. Cervical cancer is the second most common female cancer and the second leading cause of mortality among Armenian women of reproductive age.

**Problem statement:** Since 2006, the opportunistic screening program targeting women aged 30-60 with a three year screening interval has been launched in the country. However, evidence suggests that in 2010, the screening coverage among Armenia women was very low.

**Objective:** The overall objective of the current study is to analyze and discuss the influencing factors and effective interventions for improving cervical cancer screening uptake among Armenian women aged 30-60, and to formulate a set of recommendations aiming to enhance the effectiveness of the existing screening program in the country.

**Findings:** Armenian women have a lack of knowledge about cervical cancer and preventive measures available to them. In Armenia, there is no system in place that will ensure women get updated knowledge on cervical cancer or be regularly prompted to obtain cervical screening services.

**Conclusion:** The awareness raising interventions, accompanied with the delivery of systematic reminders, could be promising in increasing the cervical screening uptake among Armenian women aged 30-60.

**Recommendations:** The delivery of a comprehensive multi-component approach, encompassing the implementation of culture-sensitive educational interventions combined with the dissemination of invitation letters and follow-up telephone calls is suggested. This would aim to encourage the cervical screening uptake among Armenian women aged 30-60 and to ensure that they are prompted to uptake the services on a regular basis.

**Key words:** cervical cancer, cervical neoplasm, cervical malignancy, screening, Pap smear, barriers, uptake, effectiveness, Armenia, Eastern Europe.

**Word count:** 11,547

## 1. INTRODUCTION

Upon graduation from Yerevan State Medical University, once considered one of the best medical universities in the Caucasus region, I have perused a narrow specialization in Radiology and did a residency program at the National Oncology Center of Armenia. During my training years I saw enormous amount of women who were diagnosed with cancers of their gynecological organs in very late stages, when little can be done to substantially prolong the life of clients. Thus, I was very keen on investigating the different areas of women's knowledge related to the prevention and early diagnosis of cancer care. My residency-based investigation findings indicated the lack of knowledge regarding the risk factors for cancer development, existing preventive measures and the benefits of their timely utilization.

My genuine research interest in cancers of the reproductive organs has been persistent over years, finally culminating in the scope of my master degree, whereby I carried out a case-control study to identify the risk factors related to endometrial cancer development among Armenian women aged 45-60.

The current master degree has created another great opportunity for me to partially satisfy my curiosity in cancer research, thus, I have chosen the direction of exploring the cervical cancer preventive services in Armenia. My choice of the topic is based on the alarming statistics of high burden of cervical cancer and low uptake of the preventive Pap smear screening test by Armenian women in the light of ongoing implementation of National Program on Diagnosis, Treatment, and Prevention of Cervical Cancer in Armenia since 2006.

In this framework of current study, I will critically examine the factors contributing to low cervical screening uptake and identify effective interventions to encourage cervical cancer screening uptake among Armenian women. Furthermore, based on my findings I will formulate a set of recommendations which I believe are likely to go a long way towards increasing the effectiveness of the existing national screening program in the country.

## 2. BACKGROUND

The current chapter of the study aims to provide background information on Armenia, and to briefly discuss the health system, sexual and reproductive health issues in the country. It shall also present cervical cancer burden globally and locally, in Armenia, to equip the reader with a better understanding of situational context of cervical cancer in the country.

### 2.1. Country context

Armenia is a post-Soviet, lower middle income country which is situated in the southern Caucasus Mountains in Eastern Europe, with a surface area of 29,800 km<sup>2</sup>. It borders on Turkey to the west, Georgia to the north, Azerbaijan to the east, and Iran to the south [see Figure 1]. Administratively, Armenia is divided into 11 provinces (marzes), Yerevan being the biggest marz and capital of the country.

Officially, in 2012, an estimated 3,27 million people were living in Armenia wherein more than half of the population was composed of females and ethnic minorities were less than 2.2% (NSS et al. 2012). The state religion is Christianity and up to 95% of the population follows the Armenian Apostolic Church. Literacy among both Armenian women and men aged 15-49 is universal, whereas 23% of females and 21% of males have received higher education.

The National Statistical Service (NSS) suggests that in 2010, life expectancy at birth for females was 77.2 years and for males-70.6 years (NSS 2011). However, the general mortality rate (per 1000 population) increased from 7.45 in 1999 to 8.56 in 2011, with 85.5% of deaths being attributed to non-communicable diseases, particularly, cardio-vascular disease, cancer and diabetes. For some key demographic indicators characterizing population dynamics in Armenia refer to Appendix 1.



### 2.2. Health sector

Since the collapse of Soviet Union (SU), the inherited Semashko style (universal health care system) of Armenia has undergone a series of structural (decentralization) and radical financial reforms. The operational ownership, including financial autonomy, of health care services has been passed to 11 provincial and local governments, while the Ministry of Health (MOH) has been formally retaining regulatory function through coordination and monitoring of the decentralized system functioning (Tonoyan & Muradyan 2012; Richardson 2013). In Armenia, primary health care (PHC) services are provided through a network of urban polyclinics, rural ambulatories, family doctor's offices and rural health posts, while specialized care is delivered via secondary- (hospital, maternity homes, rural health centers) and tertiary (integrated clinics) health care institutions (Richardson 2013). Preventive health examinations are provided on the PHC level and include the regular check-ups for detecting abnormalities in blood pressure, glucose level in blood, lungs and reproductive organs (breast examination and Pap smear for women and prostate examination for men) (NSS et al. 2012).

Since 1991, there has been a stable supply in health workforce within the health system of Armenia in per capita terms. However, there is a persistent shortage of health workforce in rural regions and high concentration in the capital city (Tonoyan & Muradyan 2012; Richardson 2013).

Public financing of the HCS of Armenia is very low. In 2011, the government's expenditures on health care as a percentage of Gross Domestic Product (GDP) were 4.6 % (average for WHO European Region is 9.1%), while the health expenditure per capita was \$250 (Tonoyan & Muradyan 2012; Richardson 2013; WHO 2014). The rapid transition of the

health sector has resulted also in the development of an out-of-pocket payments dependant health care system (HCS). However, since 2006, the government has ensured the provision of PHC on the state budget, while in order to mitigate the effects of ‘shadow market’ turnover from out-of-pocket payments, in 2011, the concept of co-payments was introduced that assumed the legalization of all informal out-of-pocket payments (Tonoyan & Muradyan 2012; Richardson 2013).

In Armenia, health insurance is not compulsory. A voluntary health insurance is available and could be bought, while in rare cases it is ensured by an employer. According to ADHS data, in 2010, the health insurance coverage among women was 2%, while among men- 1% (NSS et al. 2012).

### **2.3. Sexual and reproductive health context**

In an Armenian context, issues related to sexual behavior are not openly discussed, and only in 2008 has sexual education been integrated into secondary school curricula (USAID 2010). However, it is hard to reflect on the effectiveness of instructed sexual education as so far, no evaluation as been done in that direction.

In 2010, the median age at first sexual intercourse among women (aged 25-45) was 20.7, while among men (aged 25-54) it was 19.8. However, women initiate their sexual life mostly when getting married (median age of first marriage is 21.1) and for men it is common to have multiple sexual partners before marriage. In 2010, while less than 4% of men (aged 25-49) reported to be married by the age of 20, nearly 47% of them have had an intercourse by that age (NSS et al.2012). In 2012, the percent of women having sex before age 15 was 0.5%, while in men- 0.9% (ICO 2013).

Research indicate that, in Armenia, the fertility rate of 1.7 has stayed stable during the last couple of years and is in direct correlation with a household’s wealth and women’s education level, whereby well-off and educated women tend to have less children. However, the overall contraceptive use among women of reproductive age is very low (Thompson & Harutyunyan 2006; NSS et al. 2007; NSS et al 2012). Evidence suggests that in 2010, only 55 % (53% in 2005) of currently married women aged 15-45 used any form of contraception and among identified users nearly half (20% in 2005) used modern methods, more specifically, condoms and IUDs (NSS et al. 2007; NSS et al. 2012).

It was shown that Armenian women’s practice of modern contraceptive use is determined by a set of factors such as physical access-urban versus rural residence, misinformation about modern contraceptives methods, affordability of contraceptives as well as cultural norms that might restrict a women’s ability to negotiate safer sex (USAID 2010; NSS et al. 2012; Nikoghosyan 2013). Additionally, in Armenian patriarchal society, gender based violence is gradually becoming an area of concern which might further limits women’s capabilities to discuss sexual health issues with their partners (UNFPA 2010, USAID 2010).

The availability of solid data about the prevalence of Sexually Transmitted Infections (STIs) amongst Armenian women and men is limited, however, the study carried out among Armenian infertile women aged 20-45 reported that 24.3% of surveyed women had STIs in the past, while 14.6% did not know about their previous status. Additionally, the study revealed that STIs prevalence among women residing in urban areas was two times higher of that among women living in rural regions (MOH et al. 2009).

### **2.4. Global burden of cervical cancer**

Cervical cancer (CC) is the fourth most common form of cancer in the female population and one of the leading causes of cancer deaths in women worldwide. In 2012, according to global projections, over 528, 000 new cases (incidence) of cervical cancer were diagnosed, of which 86% were in developing countries (GLOBOCAN 2012). Although the current incidence of CC decreased slightly as compared to 2008 data (530, 000 new cases), estimates suggest that

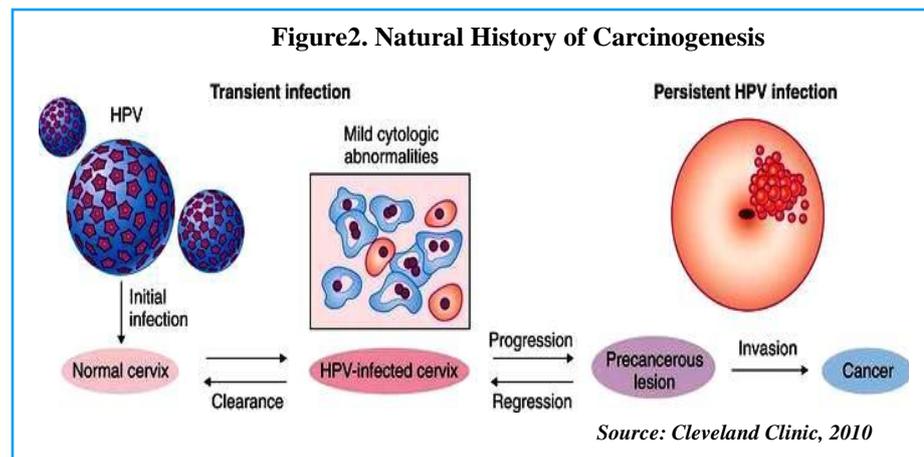
more than 1 million women have CC worldwide, most of whom have not yet been diagnosed, or have no access to quality treatment (WHO 2006; IARC 2010). In 2012, globally, an estimated 275, 000 deaths were attributed to cervical cancer, while nearly 88% of the mortality burden was falling on low- and middle income countries (GLOBOCAN 2012). The worldwide incidence and mortality rates of cervical cancer per 100,000 women for 2012 are presented in Appendix2 and Appendix3.

## 2.5. Etiology

Cervical cancer is a late outcome of an ordinary STI with some genotypes of human papillomavirus (HPV). Recent review on carcinogens reported that there is good evidence for the carcinogenicity of 12 types of HPV in the human cervix: HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58 and 59, wherein, HPV 16 and 18 are accounting for almost 70% of all cervical cancers (Bouvard et al. 2009; Bernard et al. 2010). Nevertheless, the evidence indicates that genital HPV is the necessary but not sufficient cause for cervical cancer development. While up to 80% of sexually active women will contract genital HPV at some point after initiation of their sexual lives, in more than 90% of cases it clears up spontaneously within two years and less than 10% of infected women will develop genital warts and cervical abnormalities as a result of persistent HPV infection (Roland et al. 2009). Research suggests that it takes from 10 up to 20 years from the initial genital HPV infection to develop into invasive cancer [see Figure2].

A set of factors has been identified that may increase the risk of CC development following HPV infection. These factors include the following: smoking, weakened immune system and nutrient-poor diet, existence of STIs and chronic inflammation in the

body, three and more full-term pregnancies and long-term use of oral contraceptives (Schiffman et al. 2007; Roland et al. 2009).



## 2.6. Preventive measures

In high-income countries (HIC), the cervical cancer burden was significantly reduced after the initiation of organized cervical cancer control programs. Those programs are complex and if effective, should meet the following four basic criteria: provide primary prevention<sup>1</sup>, ensure an early detection through increased awareness and organized screening programs (the ideal coverage is 80%), assure correct diagnostics and proper treatment and lastly, deliver palliative care for advanced cases (WHO 2006). Screening for cervical cancer could be performed by different procedures and screening tests. The Pap smear cytology is the first CC screening test, and was invented by Dr. George Papanicolaou in 1928 as a technique for early detection of CC through collection, smearing, and microscopic observation of cells of the cervix. It has become actively utilized in high-income countries since the 1940s and was soon integrated into the routine part of preventive screening programs, as it has been shown to be capable of

1. Primary prevention includes prevention of HPV infection and other factors that increase women's risk for CC (WHO 2006)

preventing up to 90% of the most common type of CC if carried out on regular 1-3 years interval basis (Sahasrabuddhe et al. 2012).

However, the introduction of Pap smear in low-and middle-income countries' national screening programs failed to show a noticeable decline in CC prevention. The observed trend was attributed to a persisting overall low public awareness on CC and inconveniences related to the screening test itself, restricted technical and qualified human recourse capacities, poorly developed health care services, weak referral and follow-up systems at all levels of health care as well as inadequate resource allocation and prioritization of the disease (WHO 2006; Denny et al. 2006; Sahasrabuddhe et al.2012; WHO 2014).

The failure to effectively run such a program in low-and middle-income countries has stimulated a large body of research into the development of an evidence-based alternative screening approach, such as visual inspection with acetic acid/ Lugol's iodine method (VIA/VILI), liquid based cytology (LBC) and HPV DNA test (WHO 2006; Kane 2012; Sahasrabuddhe et al. 2012; Denny et al. 2006; Wright & Kuhn 2012). Table1 shows the comparative accuracy and characteristics of different HPV screening tests.

**Table1. Accuracy and characteristics of different HPV screening tests, adapted from WHO, 2007 & Coste, 2003**

SCREENING TEST	SENSITIVITY	SPECIFICITY	RESULTS	APPROACH
Pap smear	31-78%	91-99%	Abnormal cellular alterations	Examining of cervical cell sample under the microscope by technician
HPV-DNA test	61-90%	62-94%	The virus that causes the alterations in abnormal cells	Checking a sample of cervical cells for the virus through computerized system
VIA/VILI	50-96%/ 44-93%	44-97%/ 75-85%	Possible precancerous lesions or cancer	Observing the changes in color that indicative for precancerous lesions or cancer by application of acetic acid/ Lugol's iodine to the cervix and exploration of it by health worker with the naked eye
LBC	nearly 66%	nearly 91%	Abnormal cellular alterations	Examining of cervical cell sample under the microscope by technician

*Source: WHO 2007 and Coste et al. 2003*

The understanding of the role of HPV in cervical cancer development led to the discovery of HPV vaccines. Currently, two types of HPV vaccines: Gardasil and Cervarix, have been approved by the US Food and Drug Administration (FDA) for widespread vaccination purposes and have been licensed in more than 100 countries all over the world. Gardasil, a quadrivalent vaccine against HPV 6, 11, 16, and 18, and Cervarix, a bivalent vaccine against HPV 16 and 18 genotypes, are proven to be highly effective if given before getting infected with HPV infection and administered in three-dose vaccination series over 6-month period (Romanowski 2011). However, due to the fact that the vaccines do not protect against all HPV genotypes which cause CC, it is important even for vaccinated women to continue to undergo cervical cancer screening (CDC 2011).

## 2.7.Treatment

Treatment options for cervical cancer are dependent on the stage of the cancer, its size, the client's age and her desire to have children. At the early stage of the cancer, the methods of treatment can vary between cryotherapy<sup>2</sup>, cold knife conisation<sup>2</sup>, laser surgery<sup>2</sup> and the Loop Electrosurgical Excision Procedure<sup>2</sup>. In more advance stages, depending on the

women's desire to have children or not, cone biopsy<sup>2</sup>, hysterectomy<sup>2</sup>, radical trachelectomy, radiation therapy<sup>2</sup>, chemotherapy<sup>2</sup> in standalone or in different combinations are suggested (Cancer.Net 2014).

## 2.5. Burden of cervical cancer in Armenia

In Armenia, cervical cancer is the second most common female cancer in women aged 15 to 44 years, and the second leading cause of mortality among women of reproductive age (UNFPA 2013; ICO 2013). The comparison of incidence of cervical cancer to that of other cancers in women of all ages for 2012 is illustrated in Appendix 4.

Research suggests that in recent decades there has been a positive trend in incidence of cervical cancer in Armenia. Between 2001 and 2012, the incidence rates from disease increased from 10.9- to 16.6 per 100,000 women (Avagyan & Abrahamyan 2007; ICO 2013). Furthermore, according to the Information Center on HPV and Cancer (ICO), in 2012, in Armenia, the estimated attributable crude mortality rate of CC was 6.9 per 100,000 women - one of the highest compared to countries of the neighboring region, with only Georgia showing a higher rate (ICO 2013). The incidence and mortality rates from CC in comparison with the statistics from neighboring region are illustrated in Table 2 and Table 3.

**Table 2. Incidence of Cervical Cancer in Armenia compared to the neighboring region, 2012**

INDICATOR	Armenia	Georgia	Azerbaijan	Syria	Turkey
Annual number of new cancer cases	272	425	547	210	1,686
Crude incidence rate/per 100.000 women per year	16,4	18,7	11,5	2,0	4,5
Age-standardized incidence rate/per 100.000 women per year	13,8	14,2	9,8	2,6	4,3

*Source: Information Center on HPV and Cancer, 2013*

**Table 3. Mortality of Cervical Cancer in Armenia compared to the neighboring region, 2012**

INDICATOR	Armenia	Georgia	Azerbaijan	Syria	Turkey
Annual number of deaths	115	200	214	92	663
Crude mortality rate/per 100.000 women per year	6,9	8,8	4,5	0,9	1,8
Age-standardized mortality rate/per 100.000 women per year	5,2	5,7	3,9	1,2	1,7

*Source: Information Center on HPV and Cancer, 2013*

According to Prof. G. Bazikyan, the deputy director of National Oncology Center (personal interview 10 February 2010), high mortality rate from CC in Armenia is attributed to late detection of disease (mostly III and IV stages) among Armenian women. Unfortunately, in these stages, the treatment of clients has mostly symptomatic rather than curable character (ArmeniaNow.com 2010).

### 3. PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES AND METHODOLOGY

#### 3.1. Problem statement and justification

In 2006, the MOH launched an opportunistic screening program -“2006-2015 National Program on Diagnosis, Treatment, and Prevention of Cervical Cancer in Armenia” (NPDTCC), targeting women aged 30-60 with a three-year screening interval. The aim of the program is to reduce the morbidity and mortality due to CC, timely diagnose and effectively treat precancer, and improve quality of life of those suffering from disease (MOH 2006). Due to the scarcity of financial resources in the country, all the stakeholders involved in the establishment of the national program reached the consensus that successful delivery of the opportunistic screening program, defined as screening on women who are visiting health services for reasons other than screening itself, would serve as a basis for the introduction of organized population-based cervical screening in future (Avagyan & Abrahamyan 2007). In the framework of NPDTCC, cytological laboratories have been established in selected provinces, already functioning laboratories have been supplied with essential equipment for Pap smear testing, and rural-based antenatal service provided by mobile teams have been trained on screening techniques to ensure the availability of cervical cancer screening all over the country. With WHO assistance, the majority of cytologists and general health practitioners have been trained on the proper provision of cervical screening services and the Pap smear procedure. Furthermore, cervical cancer testing has been integrated with primary health care services and provided fully on the state-supported free-of-charge basis to ensure its affordability for the entire targeted female population. To increase the demand for cervical screening among targeted women, the provision of awareness raising activities on CC, CCS, and health lifestyle have been specified as important components of the program (MOH 2006, WHO 2007, Avagyan & Abrahamyan 2007). However, there is limited access to the data reporting on the cascade of specific interventions planned by the program to make certain the information transfer to the potential clients of the screening. The protocol of NPDTCC has a set of specified targets and coverage goals to be achieved by 2015 which are presented below in Table4.

**Table4. The targets outcomes<sup>a</sup> by 2015 specified by “2006-2015 National Program on Diagnosis, Treatment, and Prevention of Cervical Cancer in Armenia”**

INDICATOR	2005 (baseline)	2010 (target)	2015 (target)
Incidence rate/per 100.000 women	13.8	Decreased by 30%	Decreased by 50%
Mortality rate/per 100.000 women	8.6	Decreased by 25%	Decreased by 50%
Percent of clients who have not received treatment	47%	Decreased by 50%	Decreased by 70%
Screening coverage among women aged 30-60 (%) <sup>b</sup>	--- <sup>c</sup>	50%	80%
False-negative results (%)	--- <sup>c</sup>	Decreased by 25%	Decreased by 60%

*Source: Avagyan & Abrahamyan, 2007*

a. All specified targets are compared to 2005 baseline data

b. Screening coverage=number screened/number of women aged 30-60 x 100%

c. No baseline data is available

Although the development of measurable targets and implementation of specific interventions in the scope of NPDTCC is a significant accomplishment for the country, the attainability of some targets is unclear for the indicators where no baseline data is available. Furthermore, up until now, no monitoring and evaluation (M&E) report was made publicly available that would specify the progress of the program on meeting those targets. Nevertheless, recent data from the 2010 Armenia Demographic Health Survey (ADHS) indicate that screening coverage among Armenian women aged 15-49 is low. Specifically, in 2010, less than 1 in 10 women of specified age (nearly 9%) have ever had a Pap smear - and among those who ever had the test, 7% had it in the three months prior to the survey (NSS et al. 2012). Furthermore, evidence suggests that there has been no substantial difference in screening uptake by urban versus rural- residence, but variations exist within the regions and also, interestingly, women with only secondary special education have been more likely to get screening than women with higher education [see Table2]. Additionally, the wealth status of women played a role in cervical screening uptake by surveyed women despite the fact that in the scope of the national program it is provided on a free-of-charge basis on the whole territory of Armenia.

The aforementioned evidence suggests a need for further research in the field to understand the underlying factors leading to extremely low cervical screening coverage within the country, and based on findings suggest specific recommendations aiming to improve the overall screening uptake among Armenian women. In the scope of the current study, screening is defined as the Pap smear testing of women aged 30-60 with the aim of timely detection and early diagnosis of cervical abnormalities. The current study emphasizes the importance of ensuring high screening coverage based on the literature suggesting the central role of screening uptake in preventing CC among women given the fact of availability of strong referral and follow-up system in the country (WHO 2006; Denny et al. 2006; Sahasrabuddhe et al.2012).

To vividly illustrate the ideal pathway of cervical screening seeking and follow-up behavior among Armenian woman and where the actual problems can be identified along the way, I have developed the diagram (partially adapted from WHO 2006) which is presented in Figure3. In spite of realizing the existence of multiple barriers in the way of women to effectively uptake CCS and follow proper management tactics, the current study focuses its attention on a detailed examination of the first part of the pathway assuming, and also based on personal observations, that screened women with suspicious and positive results are properly referred for further diagnostic confirmation, treatment and follow-up. Unfortunately

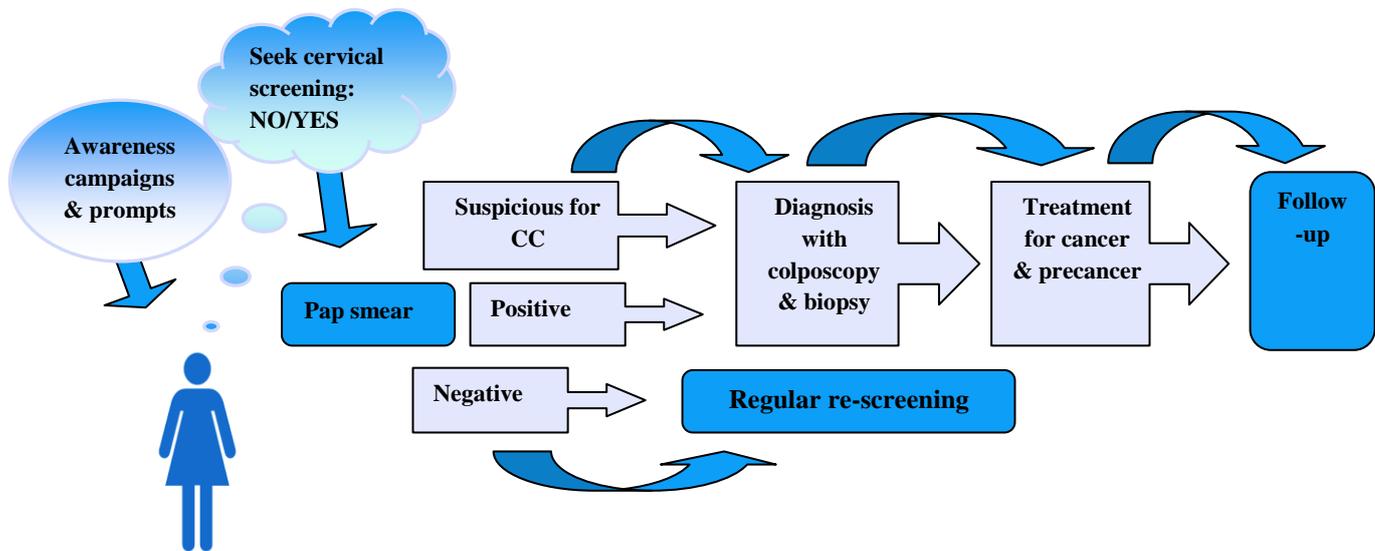
**Table5: Pap smear test uptake (%) among Armenian women aged 15-49 by age, residence, education level, and wealth status, 2010**

Background characteristic	Pap smear test		Number of women
	Ever	In the past 3 months	
<b>Age</b>			
15-19	0.4	0.4	861
20-24	4.9	4.7	1,032
25-29	10.2	9.1	950
30-34	10.8	8.8	838
35-39	14.8	10.4	643
40-44	10.4	7.0	742
45-49	16.2	9.4	857
30-49	13.0	8.9	3,079
<b>Residence</b>			
Urban	10.3	7.5	3,641
Rural	7.8	6.1	2,281
<b>Region</b>			
Yerevan	9.9	7.6	2,069
Aragatsotn	1.6	0.4	260
Ararat	8.9	7.9	379
Armavir	11.4	10.1	535
Gegharkunik	3.5	2.7	459
Lori	8.8	7.5	513
Kotayk	14.1	8.8	543
Shirak	11.5	7.8	598
Syunik	2.9	1.1	198
Vayots Dzor	7.9	5.5	131
Tavush	11.1	5.7	238
<b>Education</b>			
Basic	5.9	5.0	347
Secondary	10.2	7.7	2,137
Secondary special	10.9	8.2	1,681
Higher	7.4	5.1	1,757
<b>Wealth quintile</b>			
Lowest	7.0	5.4	1,151
Second	7.9	5.9	1,211
Middle	9.6	7.2	1,139
Fourth	11.4	7.5	1,146
Highest	10.6	8.5	1,275
<b>Total</b>	<b>9.3</b>	<b>6.9</b>	<b>5,922</b>

Source: NSS et al. 2012

no data is available on both the percentage of women who get proper management and follow-up by health providers, and actual loss of them on the way to do that after obtaining their Pap smear results.

**Figure3. Cervical screening seeking behavior, management and follow-up logical pathway adapted from WHO 2006 guideline**



### 3.2. Study objectives

The overall objective of the current study is to analyze and discuss the influencing factors and effective interventions for improving the cervical cancer screening uptake among Armenian women aged 30-60 and to formulate a set of recommendations aiming to enhance the effectiveness of the existing screening program in the country.

#### Specific objectives

1. To identify and analyze the factors influencing the effective uptake of cervical cancer screening among Armenian women aged 30 to 60
2. To identify relevant international interventions that have shown to be effective in promoting cervical cancer screening uptake among women and discuss their relevance for the Armenian context
3. To make recommendations aiming to enhance the effectiveness of the existing screening program in Armenia

### 3.3. Methodology

The current study is a descriptive study which was conducted based on literature review. The primary search was performed during May and June 2014. The literature review focused on peer-reviewed academic journal articles being published in English and Armenian languages between 1 January 2000 and 30 June 2014, applying a standardized search structure among the following databases: MEDLINE, HINARY, Scopus, EBSCO host research database, Cochrane Library, and Social Science Research Network. To find additional publications related to the topic, the Google Scholar search engine and the Globocan and IARC websites were utilized. Additionally, the websites of international agencies such as WHO, UNFPA and World Bank, World Vision and Armenian governmental and ministerial web pages were consulted. Furthermore, the reference list of key publications was examined for identifying additional, useful publications. The following key words were used in order to get quicker access to strategic information: “*cervical cancer*”, “*cervical neoplasm*”, “*cervical*

*malignancy*”, “*screening*”, “*Pap smear*”, “*barriers*”, “*uptake*”, “*effectiveness*”, “*Armenia*”, “*Eastern Europe*”. Key words were used in both standalone version and different combinations using “AND”/ “+”, “OR”, “NOR”/ “—”.

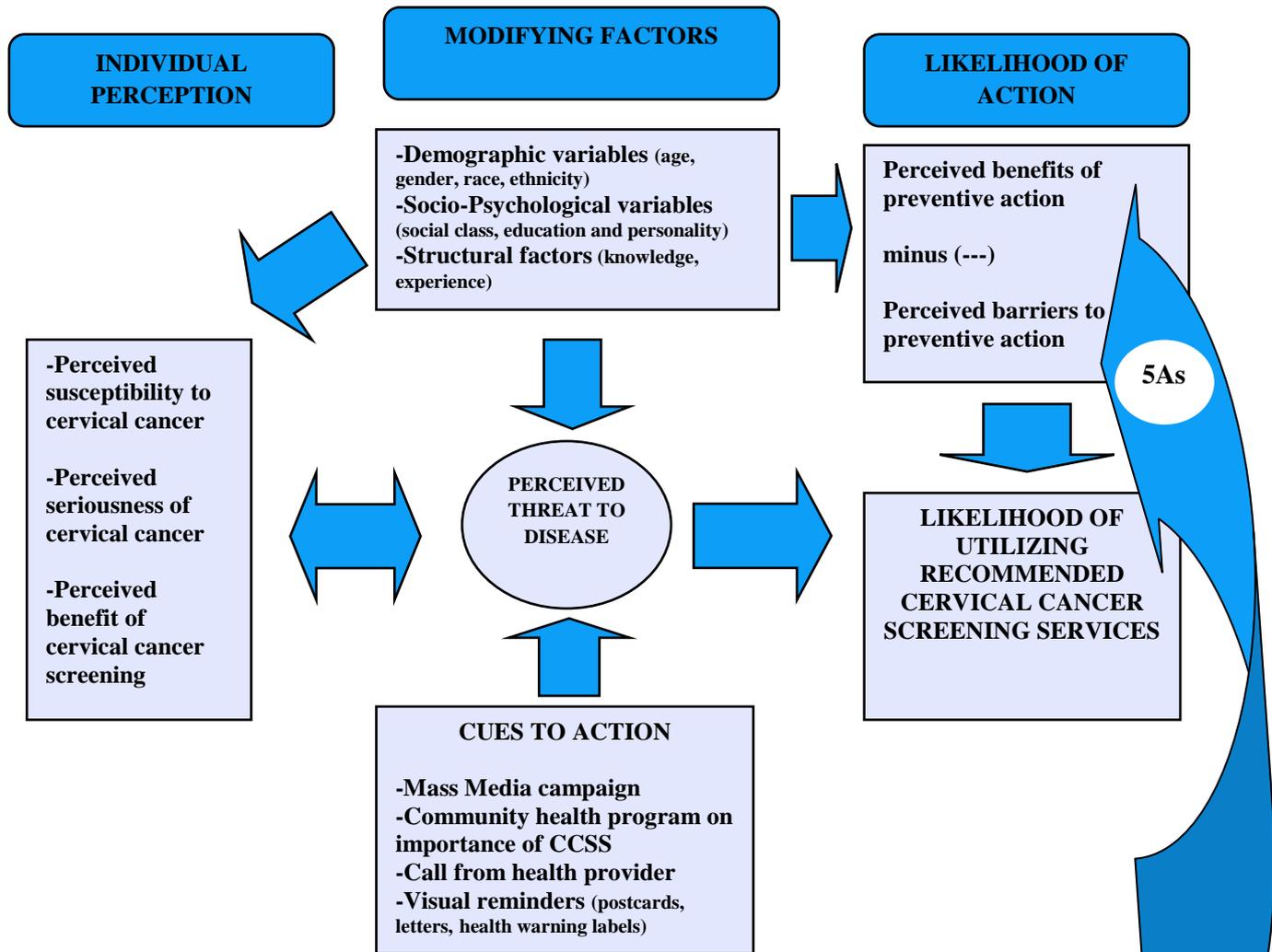
The titles and abstracts of all the research articles and reports identified by search strategy were screened. Based on preliminary review ineligible studies were excluded and further evaluation of the studies was carried out based on full text reviews.

### **3.4. Theoretical frameworks**

A great variety of theoretical frameworks have been suggested to explain health seeking behavior (HSB) among individuals or the general public. HSB examines the factors that enable people or prevent them from making "healthy choices" in their daily lives. The following theoretical frameworks could be applicable for investigating and explaining factors determining health seeking behavior: socio- behavioral model by Andersen and Aday, health belief model by Rosenstock, PRECEDE-PROCEED model (Tavafian 2012). However, in the framework of the current study the health belief model (HBM) was selected based on the evidence suggesting its validity and reliability in research investigating the factors affecting uptake of cervical screening, its explanatory nature to guide and inform why certain problems or barriers exist and lastly, high predictability to increase CCS behavior in interventions tailored to address clients’ specific beliefs regarding healthy behavior (Guvenc et al. 2011; Tavafian 2012). The original HBM, which was developed in early 1950s, described five major constructs for compliance with recommended health actions, but later, has been refined through incorporating different modifying factors suggesting their direct impact on all previously defined constructs [see Figure4] (Gillam 1991).

While HBM served as a basic tool to get deeper insights into the health behavior and probable reasons of non-compliance with recommended health actions, the part of the model referring to likelihood of taking a preventive action was analyzed by applying not only the aforementioned, but also Penchansky and Thomas model of access to healthcare services - generally known as ‘5As’. The rationale for choosing the ‘5As’ model is based on its approach to examine the client’s access from supply- and demand-side perspective, and also to describe the fit between client and healthcare services through a set of specific dimensions – availability, accessibility, affordability, acceptability and accommodation, rather than just entry into and use of it (Penchansky & Thomas 1981). The definitions for specified dimensions are presented in Table6.

**Figure4: Health Belief Model adapted from Stanhope & Lancaster, 1996**



Source: Stanhope & Lancaster, 1996

**Table6. Penchansky & Thomas model of access in the context of healthcare services, 1981**

CONCEPT	DEFINITION
<b>AVAILABILITY</b>	The relationship of the volume and type of existing services (and resources) to the clients' volume and types of needs. It refers to the adequacy of the supply of physicians, of facilities, and of specialized programs and services
<b>ACCESSIBILITY</b>	The relationship between the location of supply and the location of clients, taking account of client transportation resources and travel time, distance and cost
<b>AFFORDABILITY</b>	The relationship of price of service and providers insurance or deposit requirements to the clients' income, ability to pay and existing health insurance. The clients' perception of worth relative to total cost is a concern here, as is their knowledge of prices, total cost and possible arrangements
<b>ACCEPTABILITY</b>	The relationship of clients' attitude about personal and practice characteristics of provider to the actual characteristics of existing providers, as well as to provider attitudes about acceptable personal characteristics of clients.
<b>ACCOMMODATION</b>	The relationship between the manner in which the supply resources are organized to accept clients (including appointment system, hours of operation, walk-in facilities, telephone services) and the clients' ability to accommodate to these factors and their perception of their appropriateness.

Source: Penchansky & Thomas, 1981

## 4. FACTORS INFLUENCING THE UPTAKE OF CERVICAL CANCER SCREENING SERVICES

The current chapter identifies and analyzes the factors influencing the effective uptake of cervical cancer screening services among Armenian women aged 30 to 60, based on the Health Belief Model and Pechansky & Thomas model of access to healthcare services discussed in the previous chapter.

### 4.1. Individual perception Perceived susceptibility

A woman's belief about her likelihood of contracting a disease is generally referred to as perceived susceptibility to the disease (Janz and Becker 1984). According to the HBM prediction, women will more likely seek for Pap smear services on a regular basis if they perceive themselves susceptible to cervical cancer (Glanz et al. 2008).

The perception among Armenian women about their risk of getting cervical cancer was demonstrated to be low in a qualitative study which investigated knowledge, attitudes and practices of Armenian women with regard to Pap smear (Najaryan 2001). Several factors were shown to be important determinants for perceived susceptibility. Stress, having an abortion, the use of an intrauterine device (IUD), genetic predisposition and menopause were perceived to women as possible causes of cervical cancer development, and women who had no exposure to most of these factors did not perceived themselves at risk of cervical cancer (Najaryan 2001). Additionally, the majority of the study participants had no idea that CC has any correlation with sexual behavior. The age of 40 and above was seen as a period for development of most gynecological cancers and women under 40 had a belief that they were not at risk for CC (Najaryan 2001).

### Perceived seriousness

Perceived seriousness of a disease implies an assessment of seriousness or severity of a disease by an individual (Janz and Becker 1984). The seriousness of a disease or the consequences of leaving it untreated is evaluated by clients based on medical, social and economic factors such as pain, disability, death, an impact of the condition on family life and income, work and overall social relations. For example, it is assumed that if women consider cervical cancer to be a severe disease in its nature and capable of causing serious medical, social and economic effects on them, they would most probably use cervical screening services (Tavafian 2012). However, research shows that perceiving a disease to be serious often is not enough for seeking the screening services, as the perception that the disease is incurable can prevent women to obtain preventive screening (Ibekwe et al. 2010).

There is not much literature illustrating the perceived seriousness of CC among Armenian women, but limited evidence suggests that while cancers have not been sufficiently recognized as a serious hazard by Armenian society, gynecological cancers were acknowledged as life-threatening by most Armenian women (Najaryan 2001; ICHD 2006).

### Perceived benefit construct

Even when an individual perceives a threat from particular disease, his/her health seeking behavior is influenced by the person's belief regarding the perceived benefits of undertaking different disease specific risk reducing actions (Glanz et al. 2008). In other words, women must have a concrete belief that certain preventive actions available to her will be very beneficial in reducing her risk of cervical cancer development in order to undertake it. Thus, even people exhibiting optimal beliefs in susceptibility towards particular diseases are

not expected to accept any recommended preventive action unless they see the action as a "powerful tool" to substantially reduce their risk of disease (Ibekwe et al. 2010).

Research among Armenia women shows that, overall, the knowledge regarding cervical cancer and its risk factors, preventable nature and specifically Pap smear, was very low. While most consider systematic visits to a gynecologist and treatment of predisposing conditions as the possible approaches to prevent cervical cancer, few were implementing those actions on a regular basis (Najaryan 2001). As a matter of fact, Armenian women are oriented towards and in favor for curative rather than preventive medicine, and in this regard visit their doctors mostly when symptoms of disease come into play. Unfortunately, in most of the cases, that corresponds to the advanced stages of cervical cancer when chances of success to treat the disease are much more limited (Najaryan 2001; ICHD 2006; Avagyan & Abrahamyan 2007).

## 4.2. Modifying factors

Modifying factors (MF) such as demography (age and ethnicity), social-psychological factors (social class, gender, education and personality), structural factors (knowledge about disease and prior experience of it) are identified as factors that may have an impact on perception and, therefore, indirectly influence health seeking behavior of people. Based on this assumption modifying factors were incorporated in and became part of HBM (Gillam 1991, Glanze et al. 2008).

Socio-demographic factors, particularly age, ethnicity, gender and educational attainment are suggested to have indirect effect on cervical cancer screening seeking behavior by impacting the perception of susceptibility to-, seriousness of CC and benefits versus perceived barriers of screening obtaining behavior ( Obiechina & Mbamara 2009; Tavafian 2012).

A systematic review carried out among various ethnic groups has shown a wide range of difference in women's knowledge regarding CC, disease causes, their susceptibility, the need of cervical screening behavior and suggested that the great majority of women hold fatalistic attitudes (God's will/ punishment) about CC and have negative attitudes towards Pap smear (fear of procedure, discomfort, unnecessary unless ill) which hinder their cervical screening seeking behavior (Johnson et al. 2008). Furthermore, it is argued that a low awareness about CC and its risk factors, a lack of family support and absence of previous healthcare experience may also result in poor uptake of cervical screening services (Allahverdipour & Emami 2008; Ackerson 2010).

There is limited evidence about the influence of Armenian women's age and type of personality on uptake of CC screening services. However, some evidence suggests that they play a less important role in the Armenian context (Najaryan 2001). The level of education was shown to have an impact of screening uptake among Armenian women aged 15-49, with those having secondary or secondary special education being more prone to obtain services. Furthermore, wealth status was a predicting factor for services' uptake among Armenian women. The results showed a direct relationship between increasing wealth and uptake of services (NSS et al. 2012). The gender issues could play a role in women's screening uptake in some rural regions of Armenia where women's visits to gynecologists and taking gynecological tests sometimes is interpreted as a proof of marital infidelity. Therefore, some women are afraid to disclose and explain the results of these examinations to their partners, and thus, might decide not to take-up screening (USAID 2010).

As was mentioned earlier, there is lack of knowledge and misinformation among Armenian women regarding CC, its risks and measures of prevention (ICHD 2006; Avagyan & Abrahamyan 2007). Some women just heard that such disease exists, while others erroneously had a belief that cervical cancer cannot be prevented and if it developed one did not have any power against its nature. Furthermore, there is lack of awareness about the role of sexual contacts, STIs in CC development, while the importance of stress and number of abortions for the risk of developing CC is highly emphasized. However, regular and frequent

referral to a gynecologist is suggested by women as a way to prevent cervical cancer, though knowledge about Pap smear itself is low (Najaryan 2001). Women who possessed some knowledge about CC and Pap smear mention that they obtained it from their prior experience of undertaking the test (Najaryan 2001).

### **4.3. Cues to action**

According to the HBM, people's readiness to take particular course of actions could be potentiated by cues or triggers to initiate the action (Glanz et al. 2008). The bottom line is that women would more likely to undertake preventive behavior such as CCS if they are reminded on a regular basis. The role of cues to action in a women's readiness to uptake cervical screening has been investigated extensively. For instance, Ackerson's study suggested that the role of the health care provider in initiating the uptake of Pap smear among study participants was one of the central influential cues (Ackerson 2010). Meanwhile, another study showed that one of the effective ways to reach women is media-based public health campaigns that, however, must be delivered in a culturally meaningful and sensitive manner (Anderson et al. 2009).

Unfortunately, in Armenia there is no such system in place that will ensure that women get updated knowledge on cervical cancer or regular reminding on / invitation to obtain cervical cancer screening. Furthermore, it has been shown that Armenian women rely heavily on gynecologists and GPs as primary source of obtaining information regarding diseases of reproductive organs and any preventive measures available to them (Najaryan 2001, ICHD). However, as was mentioned earlier, they tend to apply to healthcare providers and/or initiate health seeking behavior on irregular basis or when they need curative services and thus, stay "deprived" from crucial educational exposure to preventive measures (Najaryan 2001; ICHD 2006; USAID & SI 2010).

Several studies suggest that Armenian women's use of health care facilities is influenced by specific cultural and financial barriers and sometimes is in direct correlation with her husband's readiness to take her to the healthcare facility and pay for the services ( Jowett and Danielyan 2010; USAID 2010; USAID & SI 2010; Tonoyan & Muradyan 2012). This scenario might be applicable also to the women's specific visits to gynecologists.

However, as was mentioned earlier, in the scope of national screening program, specific activities were initiated to raise awareness among Armenian women regarding cervical cancer and prevention measures (WHO 2007; Avagyan & Abrahamyan 2007). Nonetheless, there is no evidence available on the specific nature of those delivered activities and how effective they were as a clue to action.

### **4.4. Likelihood of action & 5As**

According to HBM, the odds of seeking for preventive services is determined by the difference between the perceived benefits and perceived barriers of preventive action and influenced by modifying factors. Perceived barriers to a preventive action were reported as highly important in studies focusing on behavior and relate to the negative aspects of health seeking action that results in conflicting enticement to stay away from the action (Janz and Becker 1984; Glanz et al. 2008). A kind of non-conscious assessment, cost-effectiveness evaluation takes place whereby women weigh the pros and cons of taking particular preventive action. For instance, if the sum of perceived susceptibility and seriousness of disease outweighs the perceived barriers to action there is a high probability of action to take place (Glanz et al. 2008; Tavafian 2012). Thus, identifying and minimizing the impact of perceived barriers can be used as a tool to increase the participation rates in screening programs (Farooqui et al. 2013).

In the scope of the current study, perceived barriers to preventive action are analyzed from both demand-side and supply-side perspective utilizing '5As' model. Demand-side barriers

are the factors impacting the capability of a client to use health service, while supply-side determinants are factors specific to the health system itself that hinder the client's service uptake (O'Donnell 2007).

#### **4.4.1. Perceived barriers** **Availability/ Accessibility**

As was mentioned earlier, in the scope of NPDTCC a set of actions have been taken to ensure the availability and accessibility of the screening services to women regardless of the place of residence and distance from the nearest health facility. Those initiatives have embraced the renovation of all laboratories in out-patient care facilities and supply of them with required laboratory equipment and screening tests. Armstat statistics reports that, in 2010, there were more than 504 out-patient care facilities (ambulatory facilities and polyclinics) in Armenia, wherein health posts were available and accessible in each village and run by nurses who were supervised by GPs of nearby polyclinics and ambulatory facilities (Armstat 2011).

Additionally, in the frames of NPDTCC, the up-to-date cascade of trainings on CCS and CC proper management and follow-up were provided to all GPs of out-patients health facilities. The mobile health care units, that previously were engaged solely in the provision of antenatal care to women and their children in rural areas, were reorganized and staff were retrained to provide also CCS services to women residing in remote rural regions (MOH 2006, WHO 2007; Avagyan & Abrahamyan 2007).

#### **Affordability**

The cost of healthcare services in itself is an important perceived barrier for the overall Armenian population and, thus, also women. Survey results conducted to analyze health inequalities in Armenia indicated that 44% of the population could not afford to pay and consequently did not apply to healthcare services (Tonoyan & Muradyan 2012).

However, to partially overcome that barrier, in 2006, the government of Armenia reviewed and approved the amendment, developed by collaborative effort between MOH and WHO expert group in 2005, based on which the CCS services should be provided on a state-supported free-of-charge basis in the whole territory of Armenia (WHO 2007; Avagyan & Abrahamyan 2007). However, the effectiveness of the actions directed towards assurance of publicity of government sponsored health services can be doubted as, for example, in 2012, only 40% of the entire Armenian population was aware that PHC services were government supported and provided at no charge (Tonoyan & Muradyan 2012).

Furthermore, in 2007, the efforts directed towards raising the awareness among women about CCS affordability on the whole territory of Armenia were rated as inadequate and it was recommended to strengthen the actions and involve in the process non-governmental organizations (NGOs), community leaders and health personnel to ensure that the messages on affordability of CCS reach every single resident in the country. Additionally, insufficient provision of financial resources from the government for screening tests and inadequate reimbursement of screening services at PHC level were separately delineated as factors that could impede the successful implementation of national program in the long run (Avagyan & Abrahamyan 2007). Nonetheless, it must be noted that advanced cases of cervical cancer are referred to hospitals for surgical, chemotherapy and radiation combination treatments which are currently provided on a co-payment basis. This in itself could be a huge obstacle for women to continue to seek cervical cancer treatment services. Despite the fact that there is no evidence on the actual coverage of-and percentage of loss in each subsequent step in CCS management and follow-up continuum, some evidence suggest that most of the population have difficulties in utilizing specialized care on secondary and tertiary levels even under co-payment system (Tonoyan & Muradyan 2012; OXFAM 2013). For instance, the most recent

independent study carried out to evaluate the impact of co-payment system in Armenia specified that each fifth patient made informal payments in addition to formal co-payments, while in 50% of the cases patients indicated the source of obtaining the money to be different (help from relatives, borrowing loans) from their own possessions (OXFAM 2013). Based on personal observations, I would point out that there is a certain loss in the number of positive smear women who were referred for further treatment to specialized health facilities. The loss could be attributed to both the perceived financial expenses and also the cultural specificity of Armenian women, who tend to underestimate the importance of personal health and well-being.

## Acceptability

A large body of literature suggest that barriers such as knowledge and awareness, embarrassment issues, fear of pain, lack of support, perceived quality of care, inconvenience of appointment time, and also long waiting times can affect women's uptake of cervical screening (Sankaranarayanan et al. 2001; Wong et al. 2009; Kwok et al. 2011; Farooqui et al. 2013).

The degree of acceptability of cervical cancer screening services among Armenian women is hard to evaluate accurately as a literature review revealed no specific study which was done to investigate that field. Furthermore, there is lack of data regarding the impact of potential personal barriers such as embarrassment, fear of pain, lack of support from family and friends on specifically cervical screening seeking behavior among Armenian women. Nevertheless, in 2008, the study focusing on patient satisfaction with primary health care providers in selected provinces of Armenia specified that, interestingly, the majority of study participants (78%) believed that the care they received was of 'excellent' or 'good' quality and they would attend the same provider again (89%). Additionally, residents who have been less educated and also those in rural areas were more likely to be satisfied with the providers and the quality of care offered (Harutyunyan et al. 2010). In contradiction to those findings, Tonoyan argued that more than 40% of the Armenian population directly contacts pharmacies in alternative to applying for PHC as in majority of cases (56%) respondents have been not satisfied with the quality of provided health care at PHC level. Furthermore, almost 40% of the respondents in her study mentioned the lack of trust in qualification and competencies of PHC providers (Tonoyan & Muradyan 2012). Moreover, Tonoyan identified that PHC facilities are mostly visited by the poor<sup>3</sup> and very poor<sup>4</sup> segment of the population, which could be an indirectly confirmation on existing mistrust of comparatively well-off population towards quality of care provided on PHC level. The latter group applies directly to hospitals or private clinics where they treated on co-payment or full official payment basis (Tonoyan & Muradyan 2012).

## Accommodation

In the light of evaluating the access to the services based on accommodation dimension, it should be indicated that there is no developed and commonly approved system in place that ensures the registration of appointments for clients and, thus, minimize their waiting time within the out-patient facility (Harutyunyan et al. 2010). Nevertheless, in 2008 a study carried out to assess the performance of PHC facilities in Armenia revealed that the overall mean score of facilities which was calculated based on accessibility of facilities, evaluation of the environment, assessment of the provider's engagement with the community and provision of prevention measures has increased from 1.4 (in 2006) to 1.8 (in 2008). The scores for small rural health posts also increased but were still lower compared to those of other health facilities (Harutyunyan et al. 2011).

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3. Poor in 2011 defined as per adult/per month consumption is below the upper poverty line of USD 97, 1 (World Bank 2012)

4. Very poor in 2011 defined as per adult/per month consumption is below the lower poverty line of USD 80, 2 (World Bank 2011)

## 5. EFFECTIVE INTERVENTIONS IN PROMOTING CERVICAL CANCER SCREENING UPTAKE

This chapter of the study is pursuing the goal of identifying the most effective interventions for encouraging Armenian women to undergo cervical screening. However, due to a lack of publications evaluating the effectiveness of identified interventions in Armenia and/or neighboring countries, the current study examined the overseas experiences in that prospect tailored for women of other middle-income- and/or high-income countries.

In 2006, a cross-sectional study was conducted to examine the impact of a comprehensive educational intervention program on knowledge, attitude, and practice of CCS among Armenian women living in Lebanon (Arevian et al. 2006). The educational component of the current study included the provision of a one year program that encompass the awareness campaigns on cervical cancer, knowledge dissemination on advantages of CCS and barriers women can face on the way of obtaining the Pap smear. The educational component was implemented through a series of discussions followed by dissemination of printed brochures among participants, a published article in the local periodical and radio interview with the primary investigator. Additionally, a small segment of women were also provided with cards for undergoing a free screening. The study results suggested that a one year educational intervention carried out among the sample of 176 Lebanese-Armenian women delivered in combination with ensured free-of-charge screening services raised the awareness and increased level of knowledge on CC /CSS and substantially increased the screening practice rate among defined population. Furthermore, the considerable increase in participants' levels of knowledge was observed among those attending the discussion series, while the highest rate of screening services uptake was registered among women who were provided with cards for free screening (Arevian et al. 2006).

A systematic review based on the analysis of 37 trials that aimed to increase the uptake of cervical and breast cancer screening among Asian women (Asian immigrants from US, Canada and New Zealand and those living locally, in Asian countries, such as Thailand, Taiwan, Singapore, Hong Kong and Malaysia) suggested that the provision of combination of multiple interventions has more potential for the success in cervical screening uptake than the instruction of a standalone one (Lu et al. 2012). According to the review results, weak evidence supported the effectiveness of home visits by specialist providing the culture sensitive education on cervical screening benefits followed by verbal invitation to uptake the screening among Thai women residing in Thailand. However, the personal visits with printed or video materials on hand were suggested to be more effective in CCS uptake than sending the translated educational materials by post in Indian, Pakistani, Bangladeshi women residing in New Zealand (Lu et al. 2012). Additionally, the media campaigns delivering cultural sensitive educational programs including translated, culturally sensitive print materials sent by mail were shown to be ineffective among Vietnamese women residing in USA. Also, workplace-based educational (WBE) discussions on cervical screening with health professionals have been argued to be not so effective among Filipino Americans in Los Angeles (Lu et al. 2012).

The findings on the ineffectiveness of home visits and WBE initiatives contradict with the results of other studies conducted among Thai women in Taiwan. Specifically, home visits made by local health lay voluntary workers following the model of 1 to 10 (1 worker per 10 houses) has been suggested effective in increasing women awareness on CC and screening uptake and suggested as a possible substitute for other educational interventions for low- and middle-income countries (Chumworathayi 2012). Furthermore, another study carried out to explore the effectiveness of WBE interventions among married women living in Taiwan confirmed the effectiveness of WBE interventions for improving CCS uptake among Thai women, additionally suggesting that the effectiveness of WBE among these women surpass

the effectiveness of intervention based on the dissemination of educational brochures by mail (Huang & Chang 2000).

Similar results in support for WBE interventions were shown in a recent randomized trial conducted among employed Malaysian women in Malaysia, suggesting a two-fold increase in women's CCS uptake among the intervention group, compared to that in control group. Furthermore, the implementation of WBE interventions was proposed as an option for middle-income countries where no registry exists to trace the screening eligible women (Abdullah et al. 2013).

The support towards the pivotal role of educational component in CCS uptake was shown additionally in the longitudinal study carried out among UK women. The study confirmed that that being enrolled in the training on CC and its preventive measures was associated with substantial positive change in women's screening behavior (Sabates & Feinstein 2006).

A Cochrane systematic review has been conducted in 2011 to assess the effectiveness of intervention aimed at women's uptake of cervical screening in HIC based on following subcategories: invitations (via letters, -telephone, face to face and their combinations), reminders (mass media, health providers), education (mass media, health worker, 12 week CCS education), message framing, counseling, risk factor assessment by women, procedures (access to the health prevention nurse). According to the review findings, which are based on 38 trials randomizing an overall of 159,728 women from high income countries, invitations by letters and educational interventions (EI) were the most effective in promoting the Pap smear uptake by women (Everett et al. 2011; Chumworathayi 2012). More specifically, compared with control group, the women who got the invitation letters (relative risk (RR) 1.44, 95% confidence interval (CI) 1.24–1.67), a telephone call (RR 2.16, 95% CI 1.70–2.74), an invitation letter with an open ended appointment (RR 1.61, 95% CI 1.15–2.26), a letter with fixed appointment (RR 1.80, 95% CI 1.04–3.11), an invitation letter followed by follow-up telephone call (RR 3.14, 95% CI 1.97–5.01), or pooled invitation (RR 1.65, 95% CI 1.44–1.90) were more likely to come for the CCS (Everett et al. 2011). From the perspective of the effectiveness of receiving the letters from different sources of authorities, evidence was in favor of GPs and local authority over the other sources, such as the coordinators of the local cancer prevention programs (Stein et al. 2005; Chumworathayi 2012). Furthermore, no particular form of educational intervention (for example, printed, video/slide and face to face presentation) has gained sufficient evidence to support its outweighed advantage over the other form. However, compared with mass media education, the use of lay health community workers in the dissemination of culturally proper educational messages, specifically when done in face-to-face format (RR 1.70, 95% CI 1.24–2.33), has shown to be more effective amongst ethnic minority groups. Additionally, the importance of availability and distribution of printed educational materials that cover detailed information about the screening process, notification of women on sex of health staff (smear taker) and the use of a health promotion nurse have also been mentioned to be promising in the strategies aimed to increase the Pap smear uptake by women (Everett et al. 2011; Chumworathayi 2012).

The strong evidence in favor of effectiveness of postal letter invitations (RR 1.71, 95% CI 1.60-1.83), postal letter invitations with fixed appointments (RR 1.49, 95% CI 1.27-1.75) and telephone call reminders in increasing CCS uptake among women of HIC, was provided by recent systematic review pursuing the goal of evaluating the efficacy of interventions aiming to increase participation in organized population-based screening (Camilloni et al. 2013). The review also concluded that interventions developed to reduce the logistical barriers, for example the mailing of a self-sampling device to women who do not comply with screening recommendations, significantly increases their rate of participation in CCS programs (Camilloni et al. 2013).

The important role of arranging the convenient appointment times for women was highlighted in the postal questionnaire survey by Olowokure and colleagues, whereby considerable number of women found the appointment times for CS inconvenient. Out of

33.4% of women who received invitation letters with fixed appointment times between 10:00-11:55am, only half of them found it convenient. Furthermore, while 17% of women ask for possibility to have a screening between 16:00-20:00pm, only 4.4% got the approval for that. In conclusion, the study emphasized the importance of the provision of choices for appointment times in invitation letters for CCS to meet the needs of employed and child-caring women (Olowokure et al. 2006).

## 6. DISCUSSION

The current study is the first descriptive study conducted in Armenia with the aim to give an account of the influencing factors and effective interventions for improving cervical cancer screening uptake among Armenian women aged 30-60. The rationale for choosing this focus for the study was based on the evidence highlighting increasing trends in incidence and mortality rates from CC, as well as the low uptake of cervical screening services among Armenian women despite the ongoing implementation of national opportunistic program on CC prevention in the country. While the increase in CC incidence rate can, in principle, also be attributed to the improved detection of new cases in the scope of national program, this is not consistent with my personal observations and so far, there is little discussion about the effectiveness of national program in this regard. On the other hand, the steady increase in mortality rates is mainly attributed to late detection of new CC cases, which seems to be underlying the insufficient functioning of preventive services and on its own a proxy indicator for existing gaps in the functional quality of the eight-year old national CC prevention program in Armenia.

It is unquestionable that an early detection through cervical screening is impacting on mortality rates gradually and it is might be too soon to expect a reversion in this trend. Besides, the correct management and follow-up of clients following the CC screening is a must if there are ambitious expectations to have mortality decline based on high cervical screening coverage. In other words, interventions aiming to encourage women's uptake of cervical screening services is worth implementing if the country has a sufficiently developed infrastructure and a capacity to both serve the screening needs of targeted population and provide proper referral for diagnostic, treatment services and to ensure a systematic follow-up of those at risk. Based on personal observations, there is already a proper referral infrastructure in place and the availability of up-to-date CC treatments is ensured by the health system of Armenia. Although there is no any official data on the true coverage of women on the CC management continuum, my observations indicate that there is a loss of a segment of positive smear women on the way of referral for CC treatment which could be another contributing factor to the high mortality rate of CC in Armenia.

The data indicating the low screening coverage among Armenian women has been obtained from ADHS which is done every five years in Armenia. This could be considered an area of concern, as data in the survey is obtained among the Armenian women aged 15-49, while the national screening program focuses its interventions on women aged 30-60. In that sense, we do not have data on women over 49, which put a boundary on my capacity to fully reflect on the effectiveness of the national program. However, for 2010, the Pap smear uptake of 9% among women aged 15-49 is alarmingly low, keeping in mind the ambitious targets presented by national program of having the screening coverage of 50% among women 30-60 by 2010. Furthermore, based on ADHS data, overall 7% of women aged 15-49 (over two-thirds of the 'ever-tested' rate) had their tests within the previous 3 months to the survey and there is a huge variation in screening uptake between the marzes (regions). This statistics is puzzling, as it is hard to guess firstly, what stimulated women to get their smears within the last 3 months and secondly, why some marzes did considerably better than the others? It might be ascribed to the interventions of national CC screening program, but this is just a presumption as no follow-up M&E progress report on NPDTCC is available. Additionally, AHDS data indicates the low uptake of Pap smear among women aged 15-49 with high education. This has further confused me, as in general it is believed that high attainment in education is correlated with better public health literacy and improved uptake in preventive measures. However, it is hard to accurately reflect on this finding as no study has been done in that sense in recent years and I might just assume that better educated Armenian women aged 15-49 did not see themselves as a high risk category for cervical cancer.

The HBM and '5As' model have been used as a reference to identify and analyze the factors influencing the effective uptake of cervical cancer screening services among Armenian

women aged 30 to 60. While the two models are independent from each other and are successfully utilized in standalone manner in other research, the current study integrated them to bring more depth to the health belief model's potential to fully address the first objective of the study and secondly, for better understanding of the demand-side and supply-side constructs from clients perspective that have a potential to block the desire of initiating screening services seeking behavior among women.

The analysis of my study revealed that in general, Armenian women possess limited knowledge about cervical cancer, the predisposing factors for its development, and preventive measures that are available to them. Their perception of their risk of developing the disease is very low, despite the fact that in general, gynecological cancers are acknowledged as the real threat for health and well-being of a woman. Inadequate knowledge about CC and perceived low risk for its development might be the reasons why women are slow to uptake cervical cancer screening services in Armenia. This assumption is consistent with the large body of evidence suggesting that a woman's restricted knowledge and perceptions of not being at risk for cervical cancer played a central role in not going for a Pap smear test.

Based on the above described findings, this study tends to prioritize the provision and/or strengthening of comprehensive educational component on CC, its prevention and benefits of timely and systematic cervical screening among Armenian women as one of possible ways to have an impact on cervical screening uptake by them. The effectiveness of educational interventions in encouraging the CCS uptake among women is corroborated with the large body of evidence. Nevertheless, the importance of tailoring and delivery of the culturally sensitive educational component is stressed upon. As was mentioned earlier, in some rural areas women are afraid to openly discuss issues related to sexual behavior with their partners, negotiate contraceptive use or even visit a gynecologist. For those women, the context of educational component should be tailored specifically to meet the needs of both partners. The inclusion of partners in educational interventions on CC is supported by overseas evidence suggesting that not only the low awareness on CC and its risks among the women but also the lack of support from their partners are contributing factors for poor uptake of cervical screening among women (Allahverdipour 2008).

The current study found also that there is a variation in effectiveness of educational component based on the approaches and settings of its delivery. However, the work-base educational intervention that include discussions with specialist has been supported by a number of studies to be highly effective among employed women, while the distribution of awareness raising printed brochures as well as delivery of sporadic radio programs have a potential to be effective for the entire female population. The rural segment of population has been shown to benefit most from home visits (face to face interactions) by community lay health worker (even those functioning on voluntary basis) or nurse followed by receiving printed educational materials.

Study findings suggest that, additionally, Armenian women have low awareness on Pap smear itself and the regular visits to gynecologist are recognized as a way to prevent CC. However, the absence of spare time and perceived cost of the procedure are mentioned as a concern by women who would plan to visit their doctors and obtain cervical screening in future. Therefore, it might be important to provide Armenian women with a possibility to choose between appointment times for CCS uptake. Besides, the importance of accommodating the appointments time with women's convenience in order to stimulate the CCS uptake was highlighted in previous research. However, this will require additional research among both Armenian women and health personnel as it might be seen that women would prefer fixed appointments as it increases their obligation to take action, while health personnel might not agree to work extra hours unless additional financial reward is not ensured.

Study results found that CCS services have been made affordable and available for women on the whole territory of Armenia since 2006. However, there was the overall knowledge gap among general population about the availability of free of charge PHC as well

as, according to some evidence CCS services to women, and further involvement of NGOs, community leaders and health personnel in the awareness raising actions were suggested. Hence, ensuring that women are informed on the provision of Pap smear at no cost- and availability of services in all out-patient facilities and rural mobile units can impact on the screening uptake trends among Armenian women aged 30-60.

Nevertheless, an issue of affordability can come into play in other stages of cervical cancer management, where women should co-pay for any services such as treatment and rehabilitation care, sometimes even follow-up visits that are provided at secondary and tertiary levels. These results highlight the need for pooling out additional funds in the scope of a national program and ensuring the provision of CC treatment and follow-up services if not free of charge but substantially reduced price.

From the client's viewpoint of 'access' based on acceptability and accommodation of services, the controversial results have been identified, although they primarily referred to PHC services rather than specifically CCS or overall cervical cancer care. Based on my findings, the overall satisfaction with GPs and the quality of care on PHC level is quite high among the Armenian population. Furthermore, evidence suggested that there was a positive change in the overall performance of PHC facilities based on accessibility, assessment of inner environment, GP's attitude towards- and provision of preventive measures to the clients between 2006 and 2008. However, other findings contradict the aforementioned data indicating the existence of prevailing distrust among Armenians in the quality of services and GPs knowledge and qualifications at PHC level.

Nevertheless, as a cascade of trainings on CC prevention and proper follow-up and management have been provided to all GPs of out-patients health facilities and specialist on the mobile health care units in the scope of national program, it can be assumed that this should not be a reason for non-appliance for CCS services in the future, given the premise that women are fully informed about the scope of activities done in the frame of the national program.

Study results revealed also the absence of any clues to action on cervical screening uptake among Armenian women. This is a real area of concern as evidence confirms the crucial role of clues to action in stimulation of desired preventive services seeking behavior.

In order to find the effective evidence-based clues to action and further, to be able to fully address the second objective of my study the reference to the overseas practice has been made. My analysis identified that in order to have tangible change in the women's uptake of preventive CC screening services, it is better to use a combined approach rather than standalone intervention. Furthermore, the integration of educational component with systematic delivery of letter invitations followed by a telephone call by a health care provider gained the most support based on international (mostly HIC) evidence-based experience. Acknowledging the fact that overseas practices, more specifically those practices applied and evaluated for effectiveness in HICs, may suffer from transferability into MIC context due to differences in attitude towards health and preventive behavior among women from HIC and MIC, inaccuracies in registries, low literacy rate and weak postal and telecommunication systems infrastructure in MIC, I still find that the delivery of letter invitations (either with fixed or free-to-choose appointment times) followed by telephone reminder from a health care provider is an option for Armenia to follow. My suggestion is based on the evidence that firstly, there is a high literacy rate in the country, secondly, the current national postal operator has been providing significantly improved postal services for the entire population (including rural residents) of Armenia since 2006 (HayPost 2014) and thirdly, there is a availability of digitized urban telephone network and mobile services on the whole territory of Armenia (Beeline 2014).

There are contradictory results in regards to the superiority of delivering of letter invitations with fixed over free-to-choose appointment times. However, I believe, and this was mentioned earlier in the text, this decision should be made based on small-scale, country-

specific research results as some countries may not be able to accommodate the needs of women out of regular working hours.

### **6.1. Study limitations**

The current study has some limitations, thus, all the conclusions should be considered jointly with the following points:

- This is a descriptive study and based on secondary data analysis (literature review). Evidence would be stronger if it would have included primary data i.e. conducting qualitative, quantitative or mixed-method studies to deeper explore the gap in women's knowledge on CC and CCS services, reveal underlying factors for that, examine the factors that listed as perceived barriers for initiation of uptake of screening services as well as to examine the effectiveness of screening-prompting interventions in the Armenia context.
- There has been restricted access to up-to-date valuable data on screening coverage among women aged 30-60, progress monitoring and evaluation reports on national screening program, data on referral and management of positive smear women and percentage of loss among them on the way of cervical cancer management continuum.

## 7. CONCLUSIONS AND RECOMMENDATIONS

The present study was designed to analyze and discuss the influencing factors and effective interventions for improving the CCS services uptake among Armenian women aged 30-60. Based on the study findings, the following conclusion can be made about the factors found to be influential in the effective uptake of CCS among Armenia. Armenian women have the restricted knowledge about CC and its risk factors and perceive themselves to have low risk for disease development. There is a widespread low awareness among women about preventive measures for CC and CCS availability, accessibility and affordability on the whole territory of Armenia. In Armenia, there are no clues in place to ensure women's systematic prompt for screening uptake. Furthermore, women experience hard time to find spare time for utilizing preventive CCS services and there is stable fear of using health services due to perceived potential fear for facing unexpected catastrophic health expenditures. Furthermore, based on international evidence-based practice in implementing effective CCS encouraging interventions among women, the delivery of comprehensive approach including educational component, provision of letter invitations (either with fixed or free-to-choose appointment times) and follow-up reminder by GPs or nurses are suggested to be relevant for Armenian context.

Based on the specific results and reflections of the present study, the following recommendations are prioritized and suggested in order to enhance the effectiveness of the existing screening program in the country:

1. Increase in the financial allocation to the national program on cervical cancer prevention in Armenia by the Ministry of Health/Ministry of Finance for the introduction of new- or strengthening of existent interventions aiming to increase the screening coverage among Armenian women aged 30-60.
2. Provision and/or strengthening of comprehensive culturally sensitive educational component on CC, its risk factors, preventive measures and benefits of regular, three-yearly screening among women. Workplace-base educational interventions in a form of discussions with specialist followed by the hand in of educational brochure are encouraged among the employed women, while home visits by community lay health worker/ nurse based on the 1 to 10 model followed by the distribution of educational brochure is suggested for the rural residing segment of women. Educational interventions should separately focus also on informing women about the availability, accessibility, acceptability, accommodation, and affordability of preventive measures in the scope of NPDTPCC.  
Realizing the probable restricted funding attached to educational component in the scope of national program, but still pursuing the desire to capture also the segment of women who resides in the urban settings but are not employed, it is suggested to encourage informed women to disseminate the acquired knowledge and share received brochures among other peers.
3. Involvement of additional stakeholders, such as NGOs, community leaders and health professionals via professional organizations in interventions seeking to raise the awareness on CC and the availability, accessibility, acceptability, accommodation, and affordability of preventive cervical screening on the whole territory of Armenia.
4. Establishment of a system that will ensure that women are systematically prompted to uptake CCS services in their nearest PHC facility or through mobile unit services (rural segment) on every three-year period. More specifically, a letter invitation (either with fixed or free-to-choose appointment times) and follow-up call-reminder by GPs or nurses are suggested.
5. Further research (primarily based on primary data collection) in the field of cervical cancer prevention in Armenia to deeper investigate the gap in women's knowledge on CC and CCS services, reveal underlying factors for that, fully examine the factors that listed as perceived barriers for initiation of its uptake. A small-scale research will be

required to analyze where the letters with fixed or free-to-choose appointment times will work for the Armenia context. Furthermore, additional research is required to find out up-to-date valuable data on actual screening coverage among women aged 30-60, the coverage on referral and management of positive smear women and percentage of loss among them on the way of cervical cancer management continuum.

6. Strengthening of the monitoring and evaluation system capacity within the health system of Armenia, and further, making the M&E progress report on the effectiveness of national screening program available for general public and researchers interested in the topic.

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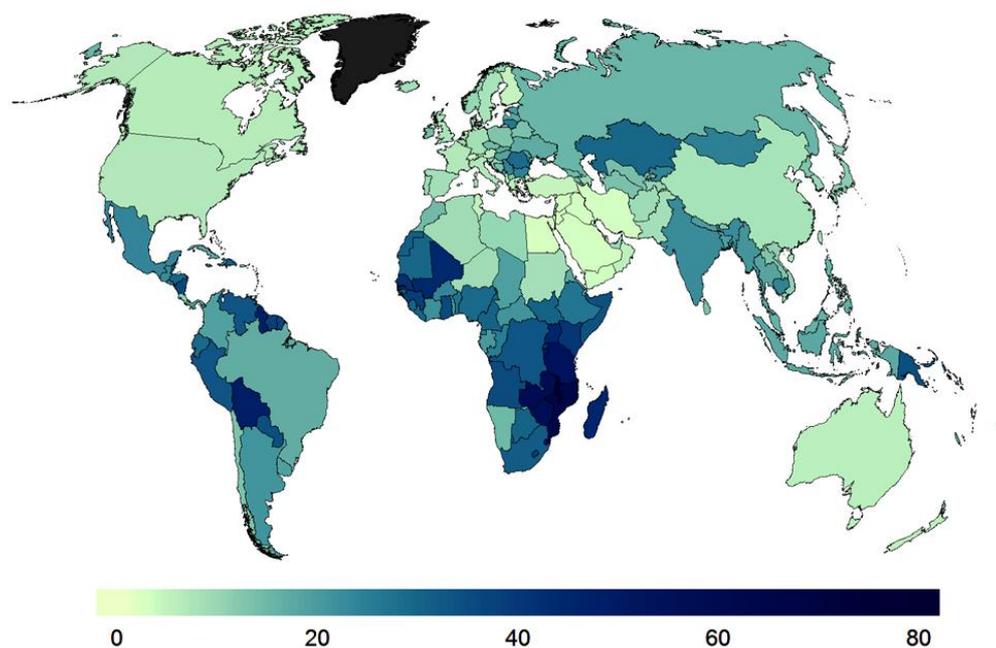
## Trends in population/demographic indicators, 1990-2011 (selected years)

	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
Population, total (millions)	3.54	3.22	3.08	3.07	3.07	3.07	3.08	3.08	3.09	3.10
Population, female (% of total)	51.5	52.6	53.0	53.3	53.4	53.4	53.4	53.4	53.5	53.5
Population aged 0-14 (% of total)	30.4	29.5	25.9	21.9	21.3	20.9	20.5	20.3	20.2	20.2
Population aged 65 and above (% of total)	5.6	8.4	10.0	12.0	12.1	11.9	11.6	11.3	11.1	11.0
Population growth (annual %)	0.1	-2.1	-0.5	0.1	0.1	0.1	0.2	0.2	0.2	0.3
Population density (people/km <sup>2</sup> land area)	124	113	108	108	108	108	108	108	109	109
Fertility rate, total (births per woman)	2.5	2.1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Birth rate, crude (per 1 000 people)	21.2	16.0	13.3	14.7	15.0	15.1	15.2	15.3	15.3	15.2
Death rate, crude (per 1 000 people)	7.7	8.7	8.4	8.4	8.5	8.6	8.7	8.8	8.9	9.0
Age dependency ratio <sup>a</sup>	56.2	60.9	55.9	51.4	50.2	48.8	47.4	46.3	45.6	45.3
Rural population (% of total population)	32.6	33.9	35.3	35.8	35.8	35.9	35.9	35.9	35.9	35.9
Literacy rate, adult total <sup>b</sup>	-	-	-	-	-	-	-	-	99.6	-

- a. The age dependency ratio is the ratio of the combined child population (aged 0-14) and the elderly population (aged 65+) to the working age population (aged 15-64)
- b. B. percentage of people aged 15 and above

Source: World Bank, 2013

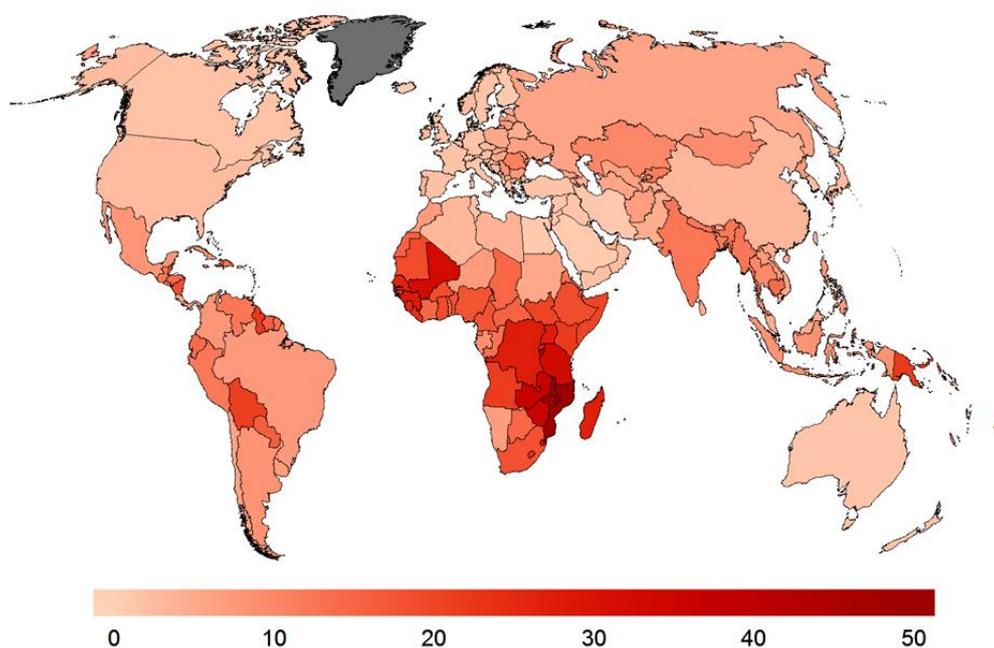
**Worldwide incidence rates of cervical cancer per 100,000 women (all ages), age-standardized to the WHO standard population, 2012**



*High cervical cancer incidence rates (>30 per 100,000) are reported for Eastern Africa (42.7), Melanesia (33.3), Southern (31.5) and Central Africa (30.6)*

*Source: GLOBOCAN, 2012*

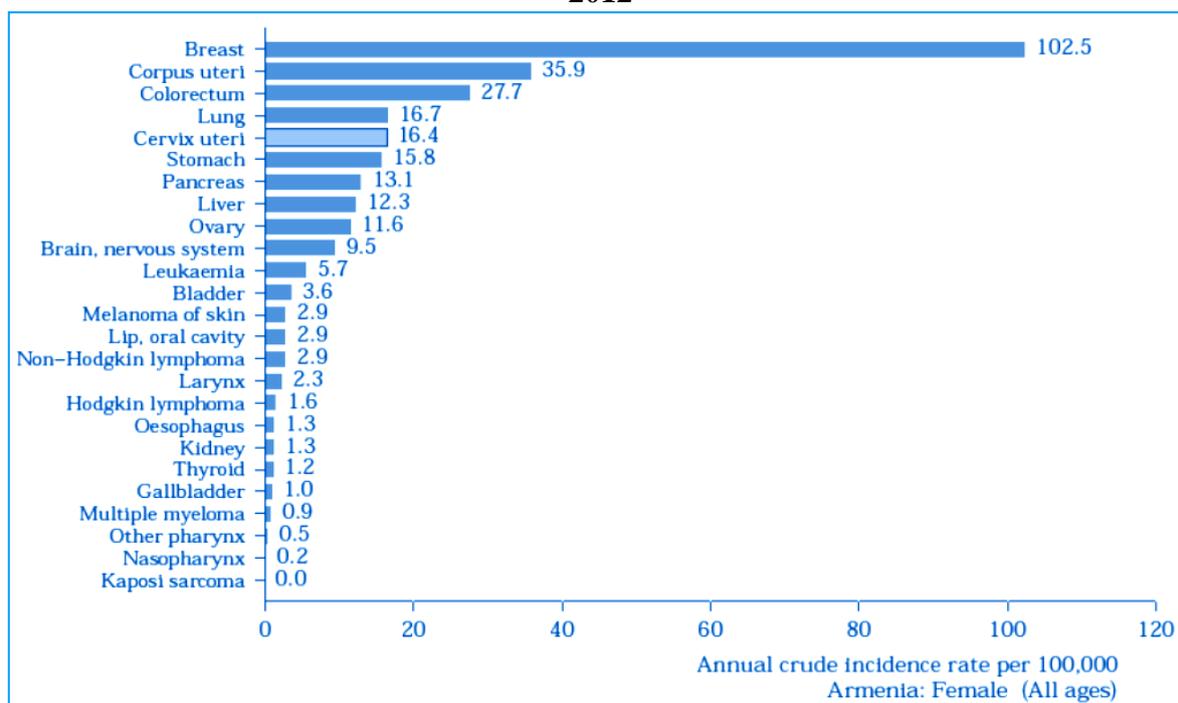
**Worldwide mortality rates of cervical cancer per 100,000 women (all ages), age-standardized to the WHO standard population, 2012**



*High cervical cancer mortality rates (>20 per 100,000) are registered in Melanesia (20.6), Central (22.2) and Eastern Africa (27.6)*

*Source: GLOBOCAN, 2012*

### Incidence of cervical cancer compared to other cancers in women of all ages in Armenia, 2012



Source: ICO, 2013